AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph on page 4, lines 15-20 of the specification, as follows:

-- FIGURE 1 is a schematic view of an optical system 100 in accordance with an embodiment of the present invention. In this embodiment, the optical system 100 includes a transmitter 110, and a receiver 120 that includes a photodiode 122. In a particular embodiment, the photodiode 122 is an avalanche photodiode (APD) 122. The transmitter 110 includes a light source 112 (*e.g.* a laser) that transmits an optical signal [[114]]<u>(not shown)</u> via a fiber optic link 116 to the receiver 120. --

Please amend the paragraph beginning on page 4, line 21 and ending on page 5, line 5 of the specification, as follows:

-- As further shown in FIGURE 1, the photodiode 122 is coupled to a control circuit 130. The photodiode 122 receives the optical signal [[114]] from transmitter 110 and converts the optical signal [[114]] into an electrical signal [[123]] (not shown), and transmits the electrical signal [[123]] to the control circuit 130. The control circuit 130 may include an amplifier 132 coupled in parallel with a resistor (or load) 134. A feedback loop 136 is coupled between an output of the amplifier 132 and an input voltage (HV) 138 of the photodiode 122. The input voltage (HV) 138 determines a gain of the photodiode 122. The feedback loop 136 includes a monitoring component 140 that is operable to monitor an output of the photodiode 122, and to adjust the input voltage 138 (*i.e.* the gain) of the photodiode 122 based on the monitored output. Preferably, the monitoring component 140 is operable to monitor a noise level in the electrical signal [[123]] from the photodiode 122, and to adjust (increase and decrease) the input voltage 138 to maintain a desired noise level (*e.g.* a desired RMS value) output by the photodiode 122. It will be appreciated that the monitoring component 140 may monitor one or more portions of the electrical signal [[123]] from the photodiode 122, or may monitor the entire electrical signal [[123]]. --

Please amend the paragraph on page 5, lines 17-25 of the specification, as follows:

-- The first term in Equation (1) is the electrical signal [[123]]. The other four terms in Equation (1) are a signal shot noise, a multiplied dark noise, an amplifier noise, and an unmultipled dark noise. All four terms contribute to the noise of the output electrical signal [[123]] of the APD photodiode 122. All of the terms except the first term (the desired signal) and the second term (the signal shot noise) exist always. The first two terms exist only in the presence of light (that is, a data '1'). For low values of M the noise statistics are dominated by the last two terms of Equation (1). As M is increased and assuming that the signal current is much greater than the APD's multiplied dark current ($I_s >> I_{db}$), the noise variance during intervals of data '1's becomes significantly greater than the variance during data '0's. --

Please amend the paragraph on page 6, lines 8-17 of the specification, as follows:

-- As shown in FIGURE 2, at a relatively low gain 204 (M=1), the noise of the electrical signal [[123]] is dominated by the terms that are independent of the gain M 204 in Equation (1), so that the noise levels for the two signal states (*i.e.* light present 206 and light absent 208) are virtually identical. In FIGURE 3, at the intermediate gain 224 (M=11), the multiplied noise of the second term in Equation (1) begins to emerge for high-state bits (*i.e.* light present 226). And in FIGURE 4, at the relatively large gain 244 (M=21), the ratio of high-state (*i.e.* light present 246 or data '1') noise to low-state (*i.e.* light absent 248 or data '0') noise is quite large. FIGURES 2-4 demonstrate that a ratio of the noise (variance) in the two binary states of the data may provide a suitable discriminator for determining when the APD photodiode 122 is approaching a breakdown. --

Please amend the paragraph on page 6, lines 18-28 of the specification, as follows:

-- In one particular embodiment, by measuring instantaneous analog output from the photodiode 122 (or from the receiver 120), subtracting the mean (signal) from each such measurement, squaring the output, and integrating these measurements over a one-bit interval, a one-bit interval estimate of a noise energy for the particular state (high or low) may be obtained. Thus, estimates of noise energy for like states may be determined, and the ratio of these two energy estimates may be compared. When the ratio exceeds an established threshold, the monitoring component 140 of the control loop 130 of FIGURE 1 may decrease the input gain 138 of the photodiode 122 so that the photodiode 122 stops increasing the gain of the optical signal [[114]] from the transmitter 110. When the photodiode 122 (or receiver 120) output again calls for *lower* voltage bias HV (*i.e.* increased gain) rather than *higher* voltage bias, the control loop 130 may increase the input gain 138 accordingly. --

Please amend the paragraph beginning on page 6, line 29 and ending on page 7, line 6 of the specification, as follows:

-- FIGURE 5 is a block diagram 300 of a receiver 320 having a control circuit 330 coupled to an APD photodiode 322 in accordance with an embodiment of the present invention. In this embodiment, the control circuit 330 includes an amplifier 332 coupled in parallel with a resistor 334 to the APD photodiode 322, and a monitoring loop 140 coupled between an output of the amplifier 322 and the input gain 338 of the APD photodiode 322. A condition determining component 342 receives an electrical signal [[323]] (not shown) from the APD photodiode 322 (via the amplifier 332) and determines whether the input signal indicates the presence or absence of light (*i.e.* whether input is '1' or '0'). --